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county, city, or incorporated district vote for such inspection. (Public Health Reports, May 14, 1915, p. 1459.)

A North Dakota act authorizes boards in charge of schools to provide for the medical inspection of school children "at least once annually." (Public Health Reports, June 4, 1915, p. 1730.)

A regulation promulgated in Porto Rico August 28, 1914, requires that every child upon enrollment "in the public and private schools and asylums" must present a certificate "as to his indemnity respecting trachoma." All school children are to be examined in January and April of each year. (Public Health Reports, Oct. 9, 1914, p. 2739.)

Communicable diseases.—A regulation of the State board of health of Mississippi makes it unlawful to employ in any school or other public or private institution any teacher, janitor, or other person suffering from a communicable disease. (Public Health Reports, Nov. 27, 1914, p. 3231.)

Vaccination.—A law passed by the New York Legislature prohibits the admission of any unvaccinated child into schools in any of the larger cities. In smaller places unvaccinated children must be excluded from school when the State commissioner of health certifies to the school authorities that smallpox exists in the "city or school district or in the vicinity thereof." Vaccination must be performed in the manner prescribed by the State commissioner of health. (Public Health Reports, Apr. 23, 1915, p. 1281.)

Dental inspection and treatment.—A board of dental hygiene was established in the Philippine Islands by an act approved February 5, 1915, for the purpose of "furnishing free dental service to the poor children in the public schools of the Philippine Islands * * * and to any and all children attending public and private schools of primary instruction." (Public Health Reports, May 7, 1915, p. 1423.)

The Legislature of the State of Kansas authorized cities having a population of 40,000 or more to provide free dental inspection for school children. (Public Health Reports, May 14, 1915, p. 1457.)

Open-air schools.—An addition to the Indiana law makes it lawful to establish open-air schools. (Public Health Reports, May 28, 1915, p. 1658.)

PUBLIC HEALTH ADMINISTRATION IN CHICAGO, ILL.

A STUDY OF THE ORGANIZATION AND ADMINISTRATION OF THE CITY HEALTH DEPARTMENT.

By J. C. PERRY, Senior Surgeon, United States Public Health Service.

[This is the third installment of this report. The first installment appeared in the Public Health Reports of August 20, 1915, at page 2442, and the second appeared in the Public Health Reports of August 27, page 2536.]

BUREAU OF HOSPITALS, BATHS, AND LODGING HOUSES.

The activities of this bureau are indicated by the name; in addition certain establishments are inspected as a preliminary for licensing. The functions of the bureau are best considered under the following subdivisions: (*a*) Hospitals; (*b*) public baths; (*c*) municipal lodging houses; and (*d*) other activities.

Organization.

A bureau chief directs the several activities, and three medical inspectors constitute the active supervising field force. The number of clerical assistants is small, as most of the records are kept in the different institutions.

Before taking up for consideration the different activities, an abstract of the ordinances governing the various institutions over which this bureau acts in a supervisory capacity will be given. These apply especially to activities other than those directly connected with establishments operated by the health department and furnish the authority for the inspection service conducted by the bureau. They are briefly summarized as follows:

Bathing beaches.—Persons conducting boating, fishing, or bathing beaches must have a license.

By methods approved by the commissioner of health bathing suits must be disinfected, washed, and dried before being given out.

The location of a beach must be approved by the commissioner, and the beach must be equipped with boats, life rafts, etc.

Every beach must have a life-saver who has presented satisfactory evidence to the commissioner that he is familiar with approved methods for resuscitation of those apparently drowned.

Each beach must have a pulmotor.

Dispensaries.—Dispensaries are defined as places where medical and surgical advice and treatment are given free to indigent persons and drugs dispensed at a nominal cost.

Any dispensary must have a license and the person in charge must apply for it in writing to the commissioner, giving accommodations, the nature of the treatment, and the names and addresses of the physicians.

The commissioner must satisfy himself as to the truth and satisfactoriness of the application before recommending that a license be granted.

Every dispensary must keep a complete record of patients treated, and this must be open for the inspection of the commissioner or his representative.

Persons conducting a dispensary are required to report to the department at once by telephone and mail all cases of smallpox, scarlet fever, diphtheria, measles, whooping cough, rabies, cerebrospinal meningitis, gonorrheal ophthalmia, and other markedly contagious or communicable diseases.

Furthermore, each licensee must report weekly to the department of health all cases of consumption, typhoid fever, syphilis, and gonorrhea reported to the dispensary, with the names and addresses of the patients.

A monthly report must be sent to the department of health showing a complete record of the dispensary during the month and the number of patients and treatments given, with a proper classification of the diseases.

Hospitals.—A hospital is defined as a place used for the reception or care, temporary or continuous, of two or more sick, injured or dependent persons, or used for

the treatment of two or more persons suffering from any mental or physical disease or bodily injury. The definition includes any hydropathic or massage institution.

A maternity hospital is defined to mean any place used for the reception and care of one or more women during pregnancy while awaiting confinement, during confinement, or for one month or less while recovering from confinement.

Such places must secure licenses and the application must make a true statement of the location of the hospital, the person for whom maintained, the accommodations, the kind of treatment, and the name and address of the chief physician, surgeon, or board of physicians.

The commissioner must have the facts of the application investigated before recommending that a license be granted.

A hospital building board, composed of the commissioner of health, commissioner of buildings, and the fire marshal, is created by one of the ordinances.

In every hospital each room to be occupied by patients must be of dimensions to give each patient not less than 800 cubic feet of space, and for each two beds there must be one window connecting with the air outside which will secure for each patient not less than 2,400 cubic feet of fresh air per hour by natural ventilation or a similar supply by mechanical means. Each bed must have at least 80 square feet of floor space. Each wing of the hospital must be provided with adequate toilet fixtures, bathrooms, lavatory, and running water. The building as a whole must be supplied with adequate stairways, exits, and proper fire escapes.

Each hospital building must have a suitable room for the isolation of communicable diseases.

No persons connected with any hospital may allow the body of a dead patient to be removed to an undertaking establishment inside of 24 hours, unless with the authority of some member of the family.

Complete records of all patients admitted must be kept. In the case of maternity hospitals the record must show the date of birth, sex, and disposition of every child born.

The superintendent, or other person in charge, must report to the commissioner daily by telephone and mail all cases of contagious diseases, such as smallpox, chicken pox, diphtheria, scarlet fever, measles, mumps, German measles, infantile paralysis, and other diseases classified by the commissioner as actively communicable. Weekly report must also be made covering mental diseases or drug addiction, typhoid fever, tuberculosis, epidemic cerebrospinal meningitis, pneumonia, and other diseases of this class. Monthly reports must be rendered, giving complete data concerning the number of patients treated, the diseases according to proper classification, and the names and addresses of patients dying during the month with the causes of death. In maternity hospitals the report must also set forth the registered number of patients received and discharged, the disposition of the infants born there, and the results of treatment.

It is unlawful for any physician, midwife, or nurse to take any women into his or her home for confinement or to place her for confinement in any place except a licensed maternity hospital.

Nursery.—A public nursery is defined as a place where, for hire or reward, infants are received and retained for more than 24 hours, while under the age of three years, for nursing and maintaining apart from their parents.

All nurseries must be licensed, the application setting forth all the particulars as to location, accommodations, and the name of the person in charge.

If investigation shows that the location, equipment, and accommodations are satisfactory, and that the superintendent is a person of good moral character and possesses sufficient knowledge for carrying out work of this character, the license is recommended.

Every person conducting a nursery must keep a register giving the name, age, and sex of every infant received, the date of reception, the names of the persons from whom

the child was received, and so far as possible the names, addresses, nationality, religion, and occupation of the parents, the time of removal, and the names and addresses of those by whom the child is removed.

Monthly reports, giving name, age, and sex of each child which is or has been in the institution during the month shall be made to the commissioner of health. Exceptions are made in institutions under the operation of the United States, State, and city officials.

Hospitals.

The following-named hospitals, operated by the department of health, are under the direction of the bureau: Contagious Disease Hospital, Isolation Hospital, and Iroquois Memorial Hospital.

Contagious Disease Hospital.—This institution receives cases of diphtheria only, and has a normal capacity of 65 beds, but when the exigency arises 80 patients can be accommodated. The hospital consists of five main buildings of two stories and basement, connected by corridors. Three of these are utilized for patients, who are distributed in the following manner in respective wards: Men and boys over 6 years, women and girls over 6 years, boys under 6 years, girls under 6 years, babies, and special rooms in which vaginitis in children is isolated. In addition, there are rooms for the isolation of cases of scarlet fever and measles that may develop in the hospital. The other two buildings are used as quarters for the employees. This hospital was constructed 20 years ago, and though the wards are light, airy, and satisfactory, much of the basement section is poorly arranged, and some essential features of a modern hospital do not exist. However, this deficiency has been overcome to a large extent by intelligent use of available facilities.

The hospital is under the direction of a capable medical superintendent, whose ability is exemplified by the excellent condition existing in this establishment. He and two assistant physicians furnish the medical care, and a staff of 17 nurses provides adequate nursing service. The necessary number of maids, orderlies, and attendants complete the personnel of the hospital proper. All employees reside on the premises.

On inspection this hospital was found scrupulously clean, and the administrative details were found correct in principle and application. The possibility of spread of infection to or through visitors is amply safeguarded.

Ambulance service.—In connection with this hospital and under the direction of the superintendent an ambulance service is maintained for handling all cases of contagious diseases removed to the different hospitals. The hospitals receiving such cases are the Contagious Disease, Isolation, Cook County, Durand, and St. Francis.

This service is equipped with five modern motor-driven ambulances and has a personnel of five ambulance surgeons, five chauffeurs,

feurs, and five attendants. There is, therefore, a surgeon, chauffeur, and attendant for each ambulance in service.

The method governing the calls for use of an ambulance has already been given in considering the division of contagious diseases. A book record is kept of the trips made, and when the case is taken to some other hospital the station is telephoned to ascertain if there are other calls to be made before returning.

The city also maintains a general ambulance service, which transports accident and emergency cases and those of all classes other than contagious diseases. This is under a superintendent, and for some reason not clearly defined is under the control of the police department.

It is believed that for efficiency of operation and economy of administration this service should be transferred to the health department, so that all the ambulances will be under one head and in the main kept ready for call at one central point. When the new Contagious Disease Hospital is completed, a garage of ample size could be erected on the grounds, and thus provide a satisfactory station. Nevertheless, it would probably be necessary to have a few substations to facilitate the work on account of the large territory covered by the city.

Isolation Hospital.—This hospital is located on the same grounds as the Contagious Disease Hospital, but sufficiently removed from the latter to meet all requirements. The Isolation Hospital receives only cases of smallpox. It has a capacity of 35 beds, but if necessary 50 patients can be accommodated, and by the use of tents, which are kept on hand, 100 cases of smallpox can be taken care of. The general arrangement of the building is satisfactory, consisting as it does of small wards and rooms for patients of different sex and age.

The hospital administration is under sisters of charity and it is satisfactorily conducted. A medical superintendent visits the hospital each morning when there are cases under treatment. He does not live on the premises, but all the employees directly connected with the hospital live in sections of the building set aside for that purpose.

An inspection showed the hospital clean, sufficiently equipped, and carefully administered to guard against any spread of infection.

Iroquois Memorial Hospital.—This is a small emergency hospital located in a congested district of the city. It was built as a memorial from funds subscribed by persons who lost relatives in the Iroquois Theater disaster. Upon completion there was no endowment to provide for its operation and it was turned over to the city and transferred to the health department for this purpose.

It has only a limited personnel; a medical superintendent, one physician, two nurses, and a few orderlies. This hospital is strictly

a first-aid institution and is not equipped for the care of patients other than as a temporary expedient. Any patient is received and given first-aid treatment, and then sent to his home or some other hospital.

Antihydrophobia treatments are given at this hospital free to all persons who have been bitten by rabid animals and who apply for the same. The cords used are generally secured from the Hygienic Laboratory of the United States Public Health Service.

An inspection showed the hospital to be clean and properly administered.

Public Baths.

There are maintained 18 public baths located throughout the poorer and tenement sections of the city. These baths are free and there is no restraint on the number of times a person can attend. They are open four afternoons a week for men and boys and twice a week for women and girls. Individual clean towels and cakes of soap are furnished each bather.

The bathhouses are in the majority of instances small, being equipped with showers varying from 14 to 40, with an average of 25. Most of the bathhouses are equipped with closed baths, arranged to provide an undressing place in connection with the shower. Three or four have open showers for men and boys, but in these houses there are closed baths for women and girls. In a few bathhouses a tub has been installed for use in bathing young children and old women. Open baths are satisfactory for men, but women and girls will not use them, and on the whole the closed ones, affording privacy, are the most desirable.

Most of the bathhouses are built with two stories and a basement; the boilers for heating the water, storage tank, and laundry are located in the basement; the baths are installed on the first floor; and the second story comprises a four or five room flat. The last mentioned provides living quarters for the bath superintendent, although in specific instances this flat is used for other purposes.

The waiting rooms at most of the baths are too small, and the patrons often have to stand on the outside waiting their turn to bathe. In the new bathhouses contemplated, greater reception-room capacity should be provided. The majority of the houses and their equipment can be considered in only fair condition. The stairways at the rear of the buildings are in need of repair, and the interior of many houses requires painting. Suitable laundry tubs and washers are needed in most of the bathhouses, and in some instances the steam plants should be repaired.

Operation.—The number of employees at a bath is limited and insufficient on account of lack of necessary funds for this activity. Each bath has a superintendent and one or two female attendants.

The former receives the people, assigns the baths, turns on the hot and cold water, regulates the duration of bath, and acts as fireman. He also keeps a record of the number bathed and forwards reports to the bureau. In the mornings he often does general repair work, pipe fitting, painting, etc. The superintendents all seem to be interested in their work and endeavor to maintain the baths of which they are in charge in as satisfactory a condition as possible. The female attendants wash the towels, all of which are boiled, scrub out the bathroom, do general cleaning, and have immediate charge of the baths when women and girls are bathing. Thirty minutes are allowed each group in which to undress, bathe, and dress. As they file out of the bathroom they must deposit the towels used in a specific place in view of the superintendent. This procedure obviates a great loss of towels.

It may be stated, in general, that the operation of the baths is satisfactory, the buildings are kept clean, and, although the number of employees is too few for the best results, this can not be avoided, since adequate funds for this activity have not been given.

The records show that a large number of people living in the vicinity of a bath freely utilize such bathing facilities, and as they are located in the poorer sections of the city, where many of the houses are not provided with bathtubs, these baths prove a boon to this class of inhabitants.

The department desires to extend such facilities and has asked for an appropriation to build a number of new bathhouses and thoroughly repair the existing ones. A larger sum is also needed for maintenance and operation, but as yet ample funds have not been appropriated.

Municipal Lodging Houses.

The city operates a main lodging house and two branch ones, which together can accommodate about 4,400 lodgers each night. Only one of the houses is owned by the city; this was formerly used as a fire station and has been repaired and equipped for its present use. The building is old and not very well suited for the purpose. The other two buildings are rented. The need of greater accommodations for the city's unfortunates is apparent and a large building of satisfactory equipment should be provided. This necessity has been realized by the health department, and an appropriation for this purpose has been requested.

The administrative center is located in this building and the records are kept here. All those who apply for lodging for the first time and those who are indisposed, suffering from colds, or are old and feeble are assigned beds in this building. Others are distributed to the branch houses, which have no sleeping accommodations except the floor, but on cold nights a blanket is furnished to each lodger.

Operation.—A superintendent has control of the three lodging houses, with his headquarters in the main one; he has an assistant and a clerk for keeping the records. There are 11 acting assistant superintendents or supervisors and 16 attendants on duty in the buildings, so that a requisite number is on duty in each watch. These employees are selected from some of the more capable lodgers.

The cooks and firemen are selected in the same manner and are paid a nominal wage. A number of housemen are selected from the lodgers for the work of scrubbing the floors and keeping the quarters generally clean. They are furnished a cot for sleeping and their food.

Another employe, who may be termed a social worker, goes among the lodgers, especially the "first nighters," learns their history and their capabilities, and endeavors to find employment for the worthy.

There is no charge for sleeping quarters and each lodger who comes in before 10.30 p. m. is given a cup of coffee and a third of a loaf of bread; at times, when the weather is extremely severe a plate of meat stew is also provided. All lodgers are also given coffee and bread in the morning.

The lodging houses open at 5 o'clock in the afternoon and remain open throughout the night. No one who applies is turned away. Each lodger, as he enters, gives his name, and the record is consulted to ascertain if this is his first application or not. If he has not previously made use of the municipal lodging house, a record card is made out, giving his name, nationality, age, occupation, how long in the United States, etc. Boys are questioned as to their condition and family history, and if they have run away as a result of an estrangement, their parents are communicated with and an effort is made to send them home. In other cases an effort is made to find employment for them.

A physical examination is made of a "first nighter" to determine whether he is suffering with a contagious disease or physical defects, and he is vaccinated if necessary. All lodgers are inspected on entrance to detect contagious disease, and all that are ill are examined by a physician and sent either to the county hospital or referred to the county physician for treatment.

Those that are furnished a bed are given duplicate checks, one of which is placed around the person's neck, and the other on the bag in which he puts his clothes. After undressing he must take a bath, put on the night shirt furnished him and go to bed. In the morning he delivers his check to an attendant, secures his clothes, and leaves the house. No lodgers are allowed to remain in the building during the day. No smoking in the building is allowed. When the applicant has been a lodger on a previous night, his card is marked with the current date, and he is assigned to one of the branch houses.

Each building is equipped with a kitchen and some rough tables for the serving of the bread and coffee.

The lodging houses open the middle of October and close June 15. In the early fall months the attendance is comparatively small, but with the advent of cold weather the number rapidly increases and remains more or less constant until spring. The number for the past two years has shown a marked increase, and during the present season the nightly average has been near 4,000.

An inspection of the municipal lodging houses found them clean and satisfactorily administered.

Rufus Dawes Hotel.—There are a number of privately owned lodging houses, but a consideration of them in this report is not required. However, one, the Rufus Dawes Hotel, is such a worthy example of what philanthropy can do for the "down and out" that brief mention seems advisable. This lodging house furnishes a bed in the main room for 5 cents or in a private room for 10 cents. It is equipped with 520 beds, ample bathing facilities, lavatories, lobby, and dining room. Bread, coffee, and meat stew can be purchased for 5 cents. The above nominal charges are made for both beds and food, and neither is furnished free. No profit is expected from the venture, but it is stated that the small charge made practically pays the cost of operation.

Inspection of lodging houses.—The bureau carries out a general inspection of all lodging houses the first of the year, but the limited personnel does not permit of satisfactory supervision. The State has several lodging-house inspectors on duty in the city, but as there are specific city ordinances regulating the cubic air space per person and the ventilation of such buildings it would seem advisable to transfer this important activity to the city health department and to enlarge the functions of this bureau by providing the necessary number of inspectors to execute this inspection service.

Other Activities.

Under this subdivision are embraced the general inspection and supervision of such institutions as hospitals, dispensaries, asylums, nurseries, and bathing beaches. A careful inspection is made of all such new establishments as a necessary preliminary for license, and a general canvass is made of all institutions of this class twice a year, in order to ascertain if the requirements of the ordinances are met and to determine their general sanitary condition. In cases where corrections have been required more frequent inspections are made until the change has been effected.

Three medical inspectors are employed in this service, and their work is more in the nature of special investigations than ordinary inspection duty. They report at the bureau each morning for assignments.

Other work performed by this bureau is the examination of persons designated as life-savers at the different bathing beaches and swimming pools. Applicants are required to undergo a practical examination as to methods of rescuing people from the water and in the resuscitation of those apparently drowned. These examinations are generally carried out at one of the gymnasiums, and the applicant is required to show thorough fitness for the position which he seeks.

Administration.

This bureau is efficiently administered, and considerable work is accomplished with a limited personnel. The different institutions under its direction are kept clean and maintained to as high a degree of efficiency as is possible with the amount of funds allotted for the different activities.

The work accomplished during 1914 is presented herewith:

Contagious Disease Hospital:

Total cases treated.....	1,318
Total cases diphtheria treated.....	1,261
Total cases diphtheria, laryngeal type.....	219
Total deaths, diphtheria, laryngeal type.....	105
Total deaths.....	143

Isolation Hospital (smallpox):

Total cases admitted.....	74
Total vaccinations, smallpox.....	1,322

Iroquois Memorial Hospital:

Total cases admitted.....	1,426
Total out-patients treated.....	5,332
Total treatments given.....	16,668
Total treatments, antihydrophobia (new cases).....	234
Total treatments, antihydrophobia (old).....	4,663
Total Wassermans made.....	428

Ambulance service:

Total day trips.....	1,351
Total night trips.....	738

Contagious diseases removed to hospitals:

Total cases—	
Diphtheria.....	1,559
Scarlet fever.....	699
Measles.....	128
Smallpox.....	67

Bathhouses:

Total baths given.....	816,328
Men.....	552,806
Boys.....	139,120
Women.....	49,278
Girls.....	75,124

Lodging houses:

Total number of lodgings.....	452,361
Admitted for first time.....	27,733
Visual inspections.....	363,869
Found diseased.....	5,559

Miscellaneous:**Inspections—**

Hospitals (primary).....	187
Asylums (primary).....	147
Dispensaries (primary).....	31
Nurseries (primary).....	20
Bathing beaches.....	26
Swimming and wading pools.....	28
Bathing establishments.....	50
Lodging houses.....	16
Complaints investigated.....	66
Special investigations.....	23
Hospital plans approved.....	4

BUREAU OF SANITARY INSPECTION.

The work of this bureau is extensive and of a diversified character and is probably best considered by taking up in detail that performed by each division. For purposes of administration nine divisions have been created, as follows: Plan examination, plumbing, ventilation, restaurants and bakeries, workshops and stables, miscellaneous, complaints, suits, and clerical.

Six of the divisions are in immediate charge each of a supervisor, the miscellaneous division is supervised by the assistant bureau chief, and the plan examination division and office are respectively under the supervision of a plan examiner in charge and a chief clerk. The line of authority is theoretically from the supervisors through the assistant bureau chief to the chief of bureau; but as it actually exists all matters go directly to the bureau chief, and the assistant only has charge of the miscellaneous division, which has three inspectors and an ill-defined authority over the plumbing division.

In a bureau having such varied activities there is some seasonable fluctuation in the number of inspectors in the different divisions. In the spring of the year more inspectors are assigned to those divisions in which inspections of various establishments are required for issuance of licenses. During summer a greater number of complaints are received, and in the winter more employees are assigned to house-to-house inspections.

Division of Plan Examination.

One of the most important functions of the bureau is the control exercised over the construction of all new buildings and any alteration or repairs of existing buildings, especially the changing of dwellings into tenement houses, and the remodeling of buildings for bakeries, restaurants, and motion-picture theaters.

The operations are carried out by the division of plan examination under authority of the State law of 1881 and ordinances governing construction, altering, or repairing of buildings.

One chief examiner and three assistants are intrusted with this work, and the plan examiner in charge is given authority to settle all minor questions as to the construction of the ordinance in particular cases. When doubt arises whether the plans, as presented, meet the particular requirements as to ventilation, plumbing, or the specific purpose for which the building is to be used, the plan is referred to the supervising inspector of the respective division. Complicated plans, and those in which examination show marked variation from the requirements of the ordinances, are referred to the chief of bureau or the assistant chief for final decision of the changes that must be made before approval will be granted.

The method pursued is to take up in turn the plans presented by applicants and examine them for the various points under the jurisdiction of the health department, such as lighting (window area), plumbing, ventilation, and size of rooms. If the plan is found unsatisfactory in any of these particulars, the person presenting it is advised of the changes necessary for approval, although in some cases a formal letter is sent the architect, covering the salient points. When the plan is approved, it is turned over to a clerk who makes a record card embracing the pertinent data, and sends the plan to the photographic room for photostatic copy to be filed with the card. Formerly a copy of the plan was retained and this method of filing proved very cumbersome.

The questions which arise in connection with new buildings of any type are relatively simple, but the application of ordinance requirements to the alteration and reconstruction of buildings often involves serious questions of reasonableness as to the extent to which the requirements affecting new houses should be applied in reconstruction cases. The consideration of such points often requires a careful weighing of salient features in order to arrive at a just and satisfactory conclusion, and one occupying the position of plan examiner must not only be endowed with certain technical knowledge but also with sound judgment.

Summary of ordinance provisions.—The provisions of ordinances governing buildings are quite extensive and difficulty has been experienced in summarizing them briefly without omitting important points; therefore, in the following abstract the importance of a clear understanding of the requirements governing buildings, especially tenement houses, in their relation to health, has been borne in mind.

Ordinances provide as follows:

All plans for the construction or alteration of any building or other structure, for which building permits are required, shall, before such permits are issued, be presented to the commissioner of health for examination and approval as to the proposed plan of ventilation of rooms, light and air shafts, windows, drainage, and plumbing. Plans must also be presented to the fire marshal for approval as to standpipes, fire-fighting apparatus, and safety.

Architects' plans, properly and accurately drawn to scale, showing lot lines, and the entire sewerage and drain pipes and the location of all plumbing fixtures must be presented.

In erecting, altering, or repairing any building, no departure from the plan approved by the commissioner of buildings and the commissioner of health shall be made, when such departure affects means of egress, ventilation, natural lighting, or sanitary conditions, without first obtaining the consent of the commissioners to the changes. Such a departure from the approved plans involves a violation of the building ordinances and operates to annul the permit issued for such work and renders the same void.

In event any work is done under a permit authorizing erection, alteration, or repair of a building or structure, which work is contrary to approved plans, the commissioner of buildings or the commissioner of health and his assistants shall have power at once to stop such work and to order all persons engaged therein to stop.

No contractor or builder shall begin work on any building or structure for which a permit is required until such permit has been secured. In case any such work has been commenced the commissioner of buildings and his assistants shall have power at once to stop the same.

Classification of buildings.—All buildings are divided into specific classes. Class II, subdivided into Class IIa, Class IIb, and Class IIc.

(a) Class IIa includes every building used for office purposes, and also every building used for clubhouse purposes where sleeping accommodations are provided for less than 20 persons.

(b) Class IIb, includes every building used for hotel, club, lodging, or rooming house purposes, where such building has sleeping accommodations for 20 or more persons.

(c) Class IIc includes every building used for hospital, for housing sick and infirm, imbeciles, or children, jails, police stations, asylums, houses of correction and detention, and homes for aged and decrepit, where sleeping accommodations are provided for more than 10 persons.

In every building hereafter erected for or converted to the purposes of Class II, courts shall be of width and area prescribed by ordinance, and every room used as a sitting room or as a sleeping room shall have at least one window opening directly upon a street, alley, yard, or court. The glass area of such window or windows shall be not less than one-tenth of the floor area of such room; at least the upper half of the window shall be capable of being opened; provided that sleeping cells in jails, police stations, and houses of detention need not have each a window, if such cells are in block which has windows equal to one-fourth of the floor area of such block, and that such cells shall be equipped with a system of mechanical ventilation approved by the commissioner of health.

In every such building there shall be at least one window in every pantry, bathroom, water-closet and urinal compartment, one-tenth of the floor area of such room, opening on street, alley, court, or ventilating shaft. If such room is located in upper story it may be lighted and ventilated by skylight having glass area of one-tenth of floor space. However, such rooms or compartments in a building used for office, club, or hotel purposes may be ventilated by an approved ventilating system in lieu of such windows.

Every mechanical ventilating system shall be tested for volumetric efficiency in the presence of a representative of the commissioner of health, and such system shall not be considered as meeting the requirements until approved by said commissioner.

Sleeping stalls.—They shall not be constructed or used in any room of any building unless such room has two or more windows which open directly upon a street, alley, yard, or court and have a total area of at least one-tenth of the floor area of such room,

nor unless the semipartitions are so constructed as to have a clear interval of at least 30 inches between their top and the ceiling. Such stalls must have not less than 400 cubic feet of air for each person when all the stalls are occupied to their full capacity.

Buildings of Class IIc shall be of fireproof construction if of more than two stories in height. Proper fire escapes, standpipes, portable pumps, and fire extinguishers shall be provided.

Class III: In this class shall be included every building used as a family residence, garage, or for stabling purposes, and having an area of less than 500 square feet.

In every building of this class every habitable room shall have a window or windows equal to one-tenth of total floor area of said room; and no window shall have a glass area of less than 10 square feet. Such room shall have a floor area of not less than 80 square feet and a clear height from floor to ceiling of not less than 8 feet 6 inches. However, attic rooms may be only 8 feet 6 inches high for more than one-half their area, and such rooms shall have a total cubic content of not less than 750 cubic feet.

In every building hereafter erected or converted for the purpose of Class III, every pantry, water-closet, bathroom, and urinal compartment shall have at least one window with a glass area of not less than 6 square feet.

Class IV: Buildings falling in this class and its subdivisions are churches, banquet halls, dance halls, assembly halls, etc. Those for motion-picture shows, vaudeville, also skating rinks, and grandstands at athletic or amusement parks.

Class V: This class contemplates buildings used as public theaters and assembly halls hereafter erected that have a seating capacity of over 300, and containing a permanent stage on which scenery and theatrical apparatus are used, and in which regular performances are given.

Class VI: In this class shall be included every tenement and apartment house or building or portion thereof, intended to be used as a residence for two or more families living in separate apartments.

Extensive provisions are made governing the construction of new tenement houses, briefly as follows:

New buildings or changes or alterations of existing tenement houses shall conform to all the requirements of ordinances, shall not be begun until a permit therefor has been issued by the commissioner of buildings, and no tenement house shall be occupied for human habitation until a permit has been issued by the commissioner of health that said building conforms to all the requirements relative to light, ventilation, plumbing, and drainage, applicable to such buildings, nor until the commissioner of buildings grants a certificate that requirements relative to fire escapes and egress have been met.

At the time of application for permit, a plat of the lot showing the dimensions and position of the building to be erected thereon shall be presented. The height of a new tenement house shall not exceed by more than one-half the platted width of the widest street on which it abuts, and no existing tenement house shall be increased beyond such height.

No existing tenement house shall be so enlarged or its lot diminished so that the rear line of any building on such lot approaches nearer than 10 feet to the rear line of the lot. If the rear of lot abuts on an alley, the rear line of the building shall be not less than 16 feet from the opposite side of such alley.

When a building exists or is erected on a lot, no other building shall hereafter be placed on the front or rear of the lot, unless there is a minimum distance of at least 10 feet between the buildings if both are only one story; five additional feet are added to the minimum distance of 10 feet for every additional story.

Existing houses shall not be enlarged, lot diminished in size, nor new building erected so as to cover more than 85 per cent of the lot area when on a corner, although in some instances 90 per cent may be allowed. On all other lots not more than 75 per cent of the lot area shall be covered by the building or buildings.

There shall be a yard or alley in the rear which is free and unobstructed from earth to sky; excepting that fire escapes, not more than four feet wide, may encroach on this space. Such yard shall have an area of at least 8 per cent of the superficial area of corner lots and 10 per cent on other lots. Every such yard shall be increased 1 per cent of the superficial area for every story above three stories in height of the tenement houses situated thereon.

The width and area of inner courts are prescribed for new tenement houses in accordance with the number of stories in height of such buildings.

Provisions also prescribe the size of outer lot line courts and their connection with street or alley.

The width and area of ventilating shafts are prescribed in accordance with the number of stories of the building, as well as the connection of such ventilating shafts with a street or alley by one or more horizontal ducts or intakes, at a level not lower than the finished grade of the building, nor higher than the second-story floor; the total area of such ducts to be not less than 3 per cent of the area of such ventilating shaft.

Every public stair hall shall have for each story a window of an area of not less than 12 square feet opening on street, alley, court, or shaft; or shall have an unobstructed vertical wellhole of proper area according to number of stories, and directly over the wellhole a skylight of twice the minimum area.

In every new tenement house all habitable rooms shall be of the following sizes:

In each apartment there shall be at least one room containing not less than 120 square feet of floor area and every other room shall contain at least 80 square feet of floor area. Each room shall be not less than 8 feet 6 inches high from floor to ceiling.

No part of any room in a tenement house shall be inclosed or subdivided by a curtain, portière, fixed or movable partition, or other device, unless each part of the room subdivided contains a separate window and has a floor area of at least 80 square feet.

No room in any tenement house shall be occupied so that the allowance of air to each adult person living or sleeping in such room shall be less than 400 cubic feet, or less than 200 cubic feet for each person under 12 years of age.

Every habitable room shall have a window area equal to at least one-tenth of the floor area. Such window shall have a glass area not less than 10 square feet and be so constructed as to at least permit opening the upper half. Bathroom, pantry, water-closets, and urinal compartment shall have windows of at least 6 square feet for each compartment.

In no new tenement houses shall any room in a cellar be constructed or occupied for living purposes, and no room in the basement shall be used for living quarters unless such room shall be at least 8 feet 6 inches high in the clear, and shall have at least one-half of such height above the finished grade of said premises at the building.

Every new tenement house more than five stories and basement high, shall be of fireproof construction; every new tenement building of three stories and basement high, and less than five stories, shall be of slow-burning or fireproof construction.

In all new tenements not of fireproof construction entrance halls and stair halls shall be inclosed with walls of solid masonry, and divisions between different apartments shall be of the same material.

Sufficient stairways and fire escapes shall be provided in accordance with character of construction, number of stories of buildings, and number of rooms. Stairways and fire escapes shall be kept unobstructed, in proper repair, and provided with suitable landing stages.

Proper plumbing shall be installed, including at least one kitchen sink with running water in each apartment, and in existing buildings where this provision does not exist, there shall be at least one sink on each floor.

Class VII: Includes every building known and described as a department store.

Class VIII: Includes every building used for school purposes and having a seating capacity of more than 100 students.

Garbage.—Proper vessels for garbage shall be provided by the owner, agent, or occupant of any building, apartment, or tenement where persons reside, board, or lodge and where food is served. This can shall be of metal with tightly fitting cover. A separate vessel shall also be provided for ashes and miscellaneous waste.

The work of plan examination is carefully executed and before approval is granted the plan of the proposed building must be accurate and complete in details. The construction of the building is followed, and the salient features pertaining to the work of different divisions are carefully watched by the inspectors. Any departure from the approved plan is noted and reported to the bureau, which orders necessary changes, or stops the work until the matter is adjusted.

This control over buildings by the commissioner of health and his assistants is a wise provision and constitutes one of the most important functions of the health department. The requirements governing the construction of tenement houses has resulted in improved housing conditions for the poorer inhabitants.

The tenement problem.—The ordinance governing the construction of tenement houses is one of the best the writer has seen, and as the requirements are now being enforced, the housing conditions are showing a gradual improvement. The law was not enacted until 1911, and previous to 1910 the work of construction was not followed up after approval of plans, and departures from the plan as presented were often made in the construction of the building. Control is now also exercised over the moving of a building from one lot to another, or to another portion of the same lot. Sufficient data must be presented to show that the proper space between buildings, yard area, etc., will exist, and one of the plan inspectors generally verifies this by actual inspection of the premises. Special attention is also paid to buildings in which repairs and alterations are approved in accordance with plans, and inspections of the work are made to determine that they are carried out.

The question of proper housing is one of the most important subjects engaging the attention of the sanitarians. The relation between damp, dark, crowded, and improperly ventilated living quarters and tuberculosis is so clearly defined that our municipal authorities and citizens generally are demanding improvements in the tenements as a preventive measure.

Chicago has its housing problem as well as every other large city, and though its rows of tenements differ in being only two and three

story buildings, the crowding in dark and unventilated rooms presents an insanitary condition that in some districts is as bad as, if not worse than, those existing in other large cities. The population per area is not so crowded as in New York, but the house and room conditions are no better.

The growth of the city has been so rapid and the influx of immigrants so large that certain definite tenement sections for unskilled labor requiring cheap living quarters have sprung up around the big industrial plants and the terminals of the various railroads. Cheaply constructed of wood, insufficiently lighted, and inadequately equipped with plumbing, in order to insure a cheap rental, these buildings are in the main insanitary and badly crowded.

The working class of the population is distributed mainly over the western and southern divisions of the city. The former section is the factory and work shops district, and contains many very insanitary tenements. In the southwest, where the lots were cheap, frame houses covering practically all the lots have been erected, and these are badly crowded and insanitary.

The poorest and most overcrowded districts are in the central portion of the city, and here the inhabitants of different nationalities occupy specific areas. In the heart of this district the Italians live; near them to the west the Poles and Jews have congregated; the Bohemians live at the southern end of this district; the Germans and Swedes occupy the north and northwest portion of this district; and the Slavs live back of the stockyards. The old houses in these districts are two-story wooden structures, overcrowded and insanitary.

The Jewish ghetto is in the heart of this district, and is squalid, dirty, and insanitary. The houses are old wooden, dilapidated affairs, and the only novelty offered is their street markets. This section is inhabited mostly by Russian Jews.

In the northern section of the city a large percentage of the buildings are brick.

The great bulk of the laboring class live in rented apartments of four to six rooms. The skilled workmen, especially the Poles, Bohemians, and Germans, however, show a strong desire to purchase their homes and build two-story apartment houses of wood or brick, living on the first floor and renting the second.

A large number of these two-story apartment houses have been built, and they are strictly a "Chicago type." An alley space, 4 feet wide, is required between houses, and a certain yard area must be provided. The new two and three story tenement houses are very satisfactory, and they are gradually replacing the old insanitary and poorly constructed buildings.

Another factor that will act to eliminate the old type of tenement is the increasing value of the lots for commercial purposes in several such sections. In a few years a decided reduction in the number of these tenement houses will thus be effected.

In order to show the improvements that are taking place in providing better housing conditions, the following statistics are presented:

New buildings.

	1909	1910	1911	1912	1913	1914
Residences, one family.....	3,078	3,075	2,989	3,266	3,745	3,846
Flats and tenements.....	4,364	4,362	4,599	4,767	6,043	6,300
Total (including other buildings)....	11,241	11,409	11,106	11,325	11,691	11,395

ANALYSIS.

	1913	1914
Tenement buildings:		
Two stories.....	3,834	3,519
Three stories.....	2,207	2,761
Four stories and over.....	2	20
Number of families in apartments:		
First floor.....	5,744	6,285
Second floor.....	6,394	6,775
Third floor.....	2,535	3,132
Basement.....	430	385
Number of rooms in apartment:		
Two rooms.....	150	292
Three rooms.....	347	535
Four rooms.....	5,091	5,577
Five rooms.....	4,581	5,150
Six rooms and over.....	4,935	5,023
Total number of apartments.....	15,105	16,577
Number of apartments with bathtubs.....	14,553	16,250

A study of the analysis of tenement houses shows that a very small per cent of apartments are in the basement, and these are nearly in all instances for the accommodation of the janitor of the building. In the old tenement houses there is a considerable number of basement apartments. There are very few apartments above the third floor and this is probably explained by the fact that such occur only in fireproof buildings. It also shows that the "Chicago type," a two-story apartment house, predominates.

Division of Plumbing Inspection.

The department of health has had control of plumbing inspection for several years, and to facilitate the operations of this division the city is divided into 23 districts, to each of which an inspector of plumbing is assigned. A supervisor directs their work. If, in the case of the plumbing in new buildings, or those undergoing repairs or alterations, any objection is made to the plans presented

because of arrangement or number of fixtures, the supervisor passes on the point.

Inspection.—The procedure is as follows: When a plan for a new building has been approved, a clerk makes an extract embracing the data concerning plumbing in the house, with street address at which the proposed building is to be erected, and a duplicate of this card is given the inspector in whose district the work is located. It is the inspector's duty to follow the construction of the building, to report progress, and especially to supervise the installation of the plumbing to see that it conforms to the requirements of the plumbing ordinance and that the requisite number of fixtures are installed and properly placed. The inspector must report within two months on the condition of the building.

The ordinance governing plumbing is embodied in 126 sections, and as the subject matter is that generally embraced in plumbing codes, a full abstract of the ordinance is not deemed necessary in a report of this character.

Briefly summarized, it provides for the examination and licensing of plumbers; proper tests of plumbing installations; specifies the number of fixtures in different buildings according to the number of persons residing or employed therein; also the size, support, and connection of the different pipes and the type of the different fixtures.

The plumbing ordinance was enacted several years ago, and some revision and amending is needed to make it more satisfactory; for instance, the size of pipe for smaller fixtures is not given, and if amended so as to require a test or clean-out plug on the house drain near the wall of the building, the work of testing the plumbing would be expedited. Furthermore, changes in plumbing in an existing building without structural changes in the house do not require a permit, so that much work of this character is installed without any supervision or testing. The inspector in the district is expected to detect these changes and see that proper installation is made; but, in the absence of any information as to locality, this haphazard procedure naturally results in much of this work escaping his attention. The remedy is to require a person desiring to change the plumbing in his house to secure a permit.

The primary test is made when the fixtures and pipes are roughed in. When the work has reached this stage, the plumber notifies in writing that the work is ready for testing. An entry is made of this fact, and the inspector is notified that certain tests are waiting his attention. A water-pressure test is then made, the record entered on the card for the particular building, and the card filed in the group of incomplete work. When the work is finished and final inspection

has been made, the record is completed and the card placed in the proper file.

As the ordinance provides that no trap shall be placed in the house drain between the building and the sewer, the proper closing of the drain for application of the water test at times taxes the ingenuity of the plumber. A simple and effective apparatus designed by the supervisor of this division consists of a rubber bag of sufficient size when distended with water firmly to close the drain pipe, with a long piece of rubber tubing attached. The method of using it is as follows: A clean-out plug is removed and the bag pushed in place and filled with water through the tube, then the clean-out opening is closed with plaster of Paris and the tube securely clamped.

The ordinance provides that after the completion of the work either a smoke test under a pressure of one inch water column or a peppermint test shall be made. The latter test is the one usually employed, but in the main must be considered unreliable and not very satisfactory. Five ounces of oil of peppermint are used for each stack up to five stories in height, and for each additional five stories or fraction thereof one additional ounce is required. This is dissolved in a sufficient quantity of warm water to cause rapid diffusion and is poured in the stack and the top of the pipe closed. As the main to the sewer is open and strong winds blowing down the street exercise a siphoning effect, this test often falls short of any practical utility. The smoke test yields more accurate results and is the proper one to be employed; but most of the apparatus is heavy and not easy to transport from place to place, and on that account not extensively used. A small smoke testing apparatus would meet the objections and yield tests of practical value.

House drains.—By the present arrangement the supervision of laying house drains is under the bureau of sewers, and such work does not fall under the plumbing inspectors. This seems to be an unnecessary division, and as the plumbing inspectors watch the construction of the building and supervise the installation of the plumbing, there is no good reason why they could not at the same time inspect the laying of the house drains. The transfer of this work to the health department would result in saving the salary of 15 inspectors and seems desirable for both administrative and economical reasons.

In addition to operations under the plumbing code the inspectors are required by bureau order to exercise functions under the ordinance governing tenement houses in determining that such houses conform with respect to lighting, ventilation, and size of rooms or courts. While it is impossible for them to verify conditions in all houses in crowded districts, they do discover many matters which require attention.

Statistics.—The work of this division is active and gradually increasing, as the following tables will show:

Plumbing inspections.

	1911	1912	1913	1914
January.....	2,925	3,000	3,653	3,928
February.....	1,526	2,577	2,696	3,201
March.....	2,845	3,148	3,167	3,874
April.....	2,681	3,780	3,118	3,590
May.....	2,921	3,490	3,058	3,845
June.....	2,960	3,500	3,392	3,977
July.....	2,638	3,253	3,432	3,486
August.....	3,471	3,425	3,043	3,245
September.....	3,139	3,495	3,318	3,503
October.....	3,177	3,271	3,725	3,867
November.....	3,113	2,496	3,327	3,289
December.....	3,412	2,865	3,564	3,946
Total.....	35,808	37,300	39,493	43,749

VARIETY OF PLUMBING INSPECTIONS, 1914.

Water tests.....	13,018
Final tests.....	11,902
Work not ready.....	3,873
Special examinations.....	14,956
Total plumbing inspections.....	43,749

The work of this division has been followed to some extent, and it was found to be satisfactorily performed. On the other hand, the number of cases found not ready for test shows that the procedure of notification by the plumbers should be modified to obviate the loss of time by inspectors.

Division of Ventilation.

So far as known the health department of Chicago has been the only one to organize a division of ventilation, and the results accomplished furnish an example worthy of being followed by other health agencies. This division was created in June, 1912; but as only one inspector was then available, the actual work dates from the commencement of the year 1913. Consequently these activities have been prosecuted for only two years. Already marked progress has been made.

Ordinance provisions.—The ordinance provides as follows:

The air in any room used as an auditorium in buildings of Class IV and V hereafter erected, and the air in assembly halls in buildings of Class VIII hereafter erected, shall be changed so as to provide each person for whom seating accommodation is provided at least 1,500 cubic feet of air per hour.

In buildings of Class VII hereafter erected the air in the different rooms shall be supplied as follows: Basement, 2,000 cubic feet for each person per hour; first to third stories, inclusive, 1,500 cubic feet per person per hour; fourth story and above, 1,300 cubic feet per hour.

For the purpose of determining the number of persons on any floor in buildings of this class in calculating the means of ventilation, the floor area per person per floor shall be on the following basis: Basement, 20 square feet per person; first story, 20 square feet per person; second story, 50 square feet; third story, 60 square feet; fourth and above, 80 square feet.

The amount of carbon dioxide in the air of auditoriums, classrooms, assembly halls, or space frequented by the public in Class VII buildings shall not be permitted to rise above 10 parts per 10,000 parts of air, and where heated artificially the temperature shall not exceed 68° F., with a relative humidity not less than 45° nor more than 80°.

In existing buildings of the class specified there shall be supplied not less than 1,200 cubic feet of air per person per hour, and the amount of carbon dioxide in the air shall not exceed 12 parts.

The ventilation of street cars shall be such as to provide 750 cubic feet of air per person per hour, and the carbon dioxide shall not exceed 12 parts.

Humidity.—The ventilation and heating, with degree of humidity, is so important for the occupants of public buildings that it is surprising how little attention has been paid to this vital subject. Supplying some fresh air and requisite heat has been the usual practice; and comfort zones, dependent upon proper humidity, are not even now receiving the necessary consideration. The heated air is often dryer than that over a desert and the high temperature necessary for a feeling of warmth in such an atmosphere produces headache and lassitude.

The necessary degree of humidity in the air at different temperatures to insure a proper sensation of warmth and comfort for the occupants of a room, has been made the subject of careful and interesting experiments by Prof. Shepperd of the Chicago Normal School. These data show a direct relation between the humidity and temperature of the air, and emphasize the necessity for careful control of the former in all properly ventilated rooms.

Procedure.—Improvement in the ventilation of theaters and other public buildings is now receiving attention. What has already been accomplished and the work outlined by the health department are of interest.

In new construction, plans of building showing means of ventilation must be submitted, and if satisfactory are approved by the plan examiner; however, if the proposed ventilation seems inadequate, the plan is submitted to the chief of the division of ventilation or one of the inspectors of this division for decision, and if necessary, changes are made so as to conform with the requirements of the ordinance. If a mechanical system is necessary all the essential data must be shown on the plan, including size and location of intake, size of fan, air washer, area of tempering and heating coils, ducts, etc., in a supply system; and in an exhaust system the size of ducts or vents, dimensions of fans, etc.

For facility in administration the city is divided into five districts and an inspector is assigned to each. A list of all buildings in which mechanical systems are to be installed is prepared by districts and is furnished to the field ventilation inspector having jurisdiction over the respective section. The duty of the inspector is to study

the plans and prepare a card for the building, making a small drawing of the floor plan and ventilation system on the reverse side of this card. This is used for reference during the installation of the system, which the inspector is required to keep under supervision, and when the work has been completed and final test made, this card is filed in the office and becomes a record for comparative purposes. In old buildings in which structural changes are made to convert them into theaters, assembly halls, workshops, and other buildings of this class, the same procedure is carried out wherever a mechanical system of ventilation is deemed necessary.

The department now makes photostat copies of general plans, and if such copies were also made in duplicate for the ventilation system, it would be in the interest of economy, as considerable time spent by the inspectors in studying the large plans and making a drawing of them would be saved.

The installation is carefully followed, and if any departures are made from the specifications on approved plans, the work is stopped and the contractor required to make the necessary changes. When completed, a final test is made of the boiler capacity, temperature of the room in determining the efficiency of the heating coils, the amount of air supplied and temperature of same, in order to ascertain whether the system supplies the requisite amount of air per person per hour, and also if the air of the room is sufficiently heated. At times the relative humidity is also taken. Anemometer readings are taken at the intake and at the main supply register to determine the volume of air, and are generally sufficiently accurate for all practical purposes; but when greater accuracy in determining volumetric measurement is desirable, the Pitot tube is used.

The above description briefly indicates the procedure during installation and final testing as a requisite for approval of the system and licensing, but no matter how perfect the system is, if it is not properly operated the desired results will not be obtained. Other duties of these inspectors are to visit the buildings from time to time in order to ascertain that the requirements of the ordinance are being met.

The activities of this bureau are devoted to new buildings, especially theaters, schools, hotels, department stores, restaurants, factories, and workshops; also to existing buildings where ventilation is inadequate, and to the heating and ventilation of street cars.

It seems desirable in this connection more specifically to describe the activities of this division in respect to particular buildings.

Theaters.—The ordinance provides that this class of buildings shall be sufficiently ventilated and that in all new buildings there shall be supplied 25 cubic feet of air per minute per person with all seats occupied. In existing buildings of this type the supply shall be not less than 20 cubic feet per minute. In new structures the carbon dioxide

shall not exceed 10 parts, and in old buildings shall not be more than 12 parts. If after due notice the proprietor or owner of a theater in which the ventilation is inadequate does not install a satisfactory system or improve the ventilation to meet the requirements, the commissioner of health is empowered to have the theater closed until the remedial measures have been carried out.

The first work to engage the attention of this division was the ventilation of theaters, and the following data are interesting in showing the vigor with which this was pushed: On December 31, 1912, there were 565 theaters, of which only 25 were ventilated; one year later there were 609, with 200 unventilated; and on December 31, 1914, there were 616 theaters, of which 156 had not been ventilated, as follows: Eighty-three closed, 56 installing equipment, leaving only 17 in operation in which the work of installation had not been started. Of the total number of theaters, only two were sufficiently ventilated by natural means; all the others have mechanical systems installed. In the term "theater" are included motion-picture halls.

Some of the large theaters have air washers installed and most of this type ventilate by means of plenum space and floor supply registers, the vent registers being placed in the walls some distance above the floor. The standard of volumetric supply through such registers is 150 cubic feet per minute, and the mushroom type of register is recommended. The smaller motion picture theaters have not installed air washers, but the intake is required to be some distance above the street level to avoid dust, and in these rooms the supply registers are either in the side walls or on each side of the stage some distance above the floor, and the vent registers are placed on the same side near the floor line, except when the supply registers are near the stage, when they are at the back of the room near the floor line.

Inspectors visit theaters during performances for collecting air samples to determine the amount of carbon dioxide. They also take samples for dust where the condition of the air indicates their advisability, and cultures are made by exposing a culture medium in a petri dish. The standard for satisfactory air is not more than 15 colonies resulting from a five minutes' exposure.

I think it can be stated without fear of contradiction that Chicago has taken the lead in enforcing proper ventilation of its theaters.

Churches.—There are 1,260 churches in Chicago and practically none have mechanical systems of ventilation, natural means being the only method of supplying fresh air; however, as they generally have ample window space the air supply is in the main satisfactory. The division has attempted no work on this class of buildings.

Dance halls.—There are 1,140 dance halls and about 50 per cent are equipped with an exhaust system of ventilation.

Hotels.—New buildings of this character are required to have an exhaust system with vent registers in all toilet and lavatory com-

partments, and a supply system for the cellar, basement, main, and first floors. Old buildings used for hotels and lodging houses are inadequately ventilated.

Schools.—Schools more than any other class of public buildings require proper heating and ventilation, as these have a direct bearing on the health and comfort of the pupils and the progress in their studies. Except in the construction of new school buildings, the division of ventilation does not exercise jurisdiction, unless complaints are made, and the installation and operation of heating and ventilation systems are under the supervision of the chief engineer of the school board. Through the courtesy of that official I visited several schools and studied the ventilation system practiced.

Of the 550 schools in Chicago, 330 are public and 220 parochial; 25 high schools are included in the former class. All the newer school buildings are properly heated and ventilated, being equipped with both supply and exhaust systems. Eighty per cent of the public schools use a plenum chamber for supplying either heated or tempered air, or the two combined, by means of dampers automatically controlled by thermostats in each room; but only a few have air washers and practically no attention is paid to humidity supply or control, both essential features for the proper ventilation of classrooms. The old school buildings are not so satisfactory and the ventilation systems are being changed in some, more modern and satisfactory types being installed. The ventilation in parochial schools is defective in more than 50 per cent of such buildings or rooms.

Street cars.—When consideration is given to the fact that of 4,715 cars of the elevated and surface lines, only 990 have mechanical ventilation systems installed, and that during 1914 the surface cars (3,284 in number) transported 853,785,689 passengers, it will be seen that the heating and ventilation of street cars has a relative bearing on the comfort of a greater proportion of the city's inhabitants than any other public place or utility. Only a few of the elevated cars have mechanical systems, and of the surface cars 1,982 are of the monitor deck type with no ventilation except by transoms for vents and the supply through the windows and doors. Since the ventilation during cold weather is entirely inadequate, this type of car is unsatisfactory. Mechanical systems of ventilation are required in all new cars placed in service.

The study of this subject involves two distinct problems—equipment and operation. The department primarily concerned itself with operation of cars in service and attempts have been made to require compliance with ordinances by civil action; but, as the ordinances make failure to equip with sufficient heaters a distinct offense, attention to equipment is now engaging attention.

Investigations carried out by the inspectors of this division during the cold weather showed that a considerable percentage of the cars are inadequately heated.

A consideration of the amount of work requiring attention to ventilation in existing buildings, new buildings, and street cars, will show that the number of inspectors allowed in this division is inadequate. The number of inspectors should be increased so as to allow extension of the activities of this division.

Division of Bakeries and Restaurants.

Bakeries.—The city is divided into six bakery districts, to each of which is assigned an inspector whose duty is to exercise supervision over the bakeshop proper, the construction of the room or rooms, natural lighting, ventilation, toilets, wash rooms, cleanliness of utensils, clothing of bakers, and general sanitary conditions in the shop. The supervision of the finished products of the bakery in the salesroom is under the inspectors of the food bureau.

The ordinances governing bakeries are briefly summarized as follows:

All bakeries must be licensed, and the commissioner of health must cause them to be examined as to location, lighting, ventilation, sanitary arrangement, and equipment as a preliminary to licensing.

No new bakery is to be established in any room, basement, or cellar in which the height between floor and ceiling is less than 8 feet 6 inches, or in any room or place the floor of which is more than 5 feet below the street or sidewalk adjacent to the building, or in any room not naturally lighted by means of door and windows.

The floors of bakeries below street level must be of cement, tile, or other impervious material, and those above street level of hard wood or impervious material; also the walls and ceiling shall be smooth, kept in good repair and kept painted, lime washed, or calcimined.

Every place used as a bakery must be kept in a clean and sanitary condition as to its floors, walls, ceiling, fixtures, tools, machinery, and utensils. All parts of the bakery must be adequately lighted and properly ventilated.

Every bakery must be kept free from flies, and windows and doors and any other openings are to be fitted with wire screens between April 1 and December 1. The bakeries are also to be provided with satisfactory plumbing and sinks, and water-closets in a separate compartment.

Persons afflicted with consumption, venereal disease, or any other communicable or loathsome skin disease will not be allowed to work in a bakery.

All employees engaged in the manufacture or handling of bakery products must have washable clothes and slippers or shoes for use in the bakery.

No person may sleep in any bakery or in the rooms where flour or meal or food products are stored. No domestic animals except cats are allowed in bakeries.

In a city the size of Chicago, with a population of various nationalities, the bakeries will be found to vary considerably in general sanitary condition; and it was noted in the inspection work carried out that the character of the neighborhood was largely reflected in the cleanliness of the bakeries. Those in the better and newer sections of the city were cleaner and of better construction than those in the older and poorer sections. Furthermore, it was shown that the bakeries located in basements and cellars were, in the majority of instances, in a less satisfactory condition than those in other parts of a building. Of 16 cellar bakeries, 5 were found satisfactory and 11 unsatisfactory. Forty-two other bakeries were also inspected. Four large bakeries were in excellent condition, and 1

large cellar bakery was very insanitary. Of the remaining 37, conditions were satisfactory in 15, fair in 14, and poor in 8. Sixty-two other bakeries were inspected by employees of the efficiency division, and the conditions found correspond closely to those given above.

There are several very large bakeries, modern in every detail, including mechanical ventilation systems with air washers, in which practically all operations are carried out by machinery even to wrapping the loaves. In one of the new bakeries, where the wrapping machine was in process of installation, the conditions of cleanliness had been met by requiring the employees to wear clean white gloves while handling the finished products.

The conditions found in many of the so-called "home bakeries" reached the other extreme. In many the floors, pans, proof boxes, and other equipment were dirty, and the employees often did not pay necessary attention to cleanliness in handling bakery products. Careful study was made of the character, conditions, and general cleanliness of the floors of the bakeries inspected. This showed that cement floors are the most difficult to clean and were practically always in a dirty condition. Hardwood floors are much easier to clean, and they were in a much cleaner and more satisfactory state. The difference in point of cleanliness was forcibly illustrated in several instances where a portion of the cement floor had been covered with hardwood, demonstrating that either hardwood, or in the case of cellar bakeries, a cement floor with such a wood covering is the most satisfactory floor. This statement applies especially to the small bakeries. In the large modern ones the cement floor is satisfactory.

The salient features of the score cards of 500 bakeries are presented in the following tabulated statement:

Bakeries.

Location:		Construction of floors:	
Entire building.....	5	Hardwood.....	345
Upper floors.....	28	Cement.....	90
First floor.....	392	Hardwood and cement.....	36
Basement.....	15	Pine.....	25
Cellar.....	59	Tile.....	2
Subcellars.....	1	Hardwood and brick.....	1
Total.....	500	Total.....	500
Ventilation:		Condition of floors:	
Adequate.....	471	Good.....	470
Inadequate.....	29	Fair.....	23
Total.....	500	Poor.....	7
Mechanical.....	34	Total.....	500
Natural.....	466	Basement bakeries with licenses.....	13
Total.....	500	Cellar bakeries with licenses.....	36
Air circulation:		Cellar bakeries without licenses.....	24
Good.....	392	Bakeries licensed.....	427
Fair.....	88	Total.....	500
Poor.....	18	General cleanliness, average for 500.....	81.38
None.....	2	Cleanliness of employees, average for 388.....	82.25
Total.....	500	Number of employees.....	1,502
Lighting:			
Adequate.....	470		
Inadequate.....	30		
Total.....	500		

The percentage average of general cleanliness of bakeries and employees given in the table seems too high and was not borne out by the writer's inspections.

It will be noticed that a number of cellar bakeries are operating without a license, although required by ordinance; therefore an explanatory statement becomes necessary.

The validity of the bakery ordinance is in question and suits brought under it fail in convicting the offender. If an appeal to the Supreme Court is taken and a favorable verdict rendered, the campaign for improved conditions in bakeries can then be pushed with vigor; should the decision be unfavorable a new ordinance will need to be enacted.

The work of the sanitary bureau has been seriously handicapped by its inability to enforce the necessary requirements; but it has been successful in its campaign to eliminate cellar bakeries and has reduced the number of this class from 581 in 1907 to 187 in 1914. Of the cellar bakeries remaining, 62 are operating under agreement to vacate the premises upon the expiration of their leases.

A general improvement not only in the location of bakeries, but also in their general sanitary condition, has been effected, and although much is still necessary to bring the bakeries as a whole up to the required sanitary plane proper for such establishments, there is no doubt that steady progress will be made until this level is reached.

The table presented herewith is interesting in showing progress made in improving conditions governing bakeries.

Bakeries.

	1907	1908	1909	1910	1911	1912	1913	To Dec. 31, 1914.	Total	In- crease.	De- crease.
Cellar bakeries.....	581	485	333	294	271	240	202	187	.....	.....	394
Daylight.....	744	855	1,022	1,093	1,164	1,342	1,419	1,454	.....	710	.....
Building plans approved for new bakeries.....	.....	65	78	60	41	55	47	30	373	.....	.....
Proposed locations ex- amined.....	.....	186	228	192	172	168	230	202	1,368	.....	.....

The proposed location of a new bakery is inspected and report made as to whether the room is satisfactory in natural lighting, ventilation, and space to be occupied. Many of the bakeries are crowded into rooms too small for the purpose. In new bakeries the work of construction or alteration in existing buildings is supervised, and the proper installation of equipment followed up. Advice is often given as to location of the oven, etc., that the space can be properly utilized with a maximum of light and air circulation.

A score card is made for each bakery, containing pertinent data as to floors, walls, lighting, ventilation, and general sanitary conditions; on the reverse side of this card a floor plan of the bakery is drawn to scale, showing the location, number, and size of windows,

place occupied by the oven, etc. This furnishes an office record of value.

A supervisor is in charge of the division. He examines plans for new bakeries and has general control of the work in the division and supervision of the field inspectors.

It has already been stated in the brief mention of bakeries in the report on the food bureau, that the inspection of bakeries should be performed by the food inspectors after the structural changes and equipment have been concluded. This suggestion has met with approval, and the operation of bakeries, the manufacture of food products, and the general sanitary conditions pertaining thereto have been transferred to the food bureau. There are more specific ordinances governing the proper preparation of food products, and these can be made effective concerning bakery products, so that more supervision will be exercised under the new régime, and prosecutions for failure to maintain satisfactory sanitary conditions will be more effective.

Restaurants.—The types and varieties of restaurants vary considerably in different localities, and as in bakeries, they are often an index of the general conditions in the district. Many of them are poorly equipped and not kept as clean as they should be; yet, on the whole, their average is better than that of bakeries.

It is necessary for the proprietor to secure a license, and in all new restaurants an inspection is made to determine if the place is suitable, special attention being paid to lighting, ventilation, and general sanitary condition. The supervision of construction and equipment is vested in the inspectors of the sanitary bureau, but after operation is commenced the inspectors of the food bureau have jurisdiction.

Division of Workshops and Stables.

Workshops.—The definition of a workshop under the ordinance is a house, room, or place used for the purpose of carrying on any process of making, altering, repairing, or finishing for sale or wages any clothing, purses, feathers, fans, artificial flowers, or cigars.

Ordinances provide as follows:

Such work may not be carried on in any living or sleeping room, nor in any cellar or basement, and the workshop must be kept clean and in a sanitary condition.

A license must be secured, and kept posted. Before it is granted the proposed workshop must be inspected for light, ventilation, and general sanitary condition.

There must be 500 cubic feet of air space for each and every person employed, and ventilation must be sufficient to provide four complete changes of air per hour during the hours of employment.

Referring to the definition, it will be seen that factories engaged in the manufacture of articles other than those enumerated do not

fall in the class of workshops. They are more specifically regulated by the State law governing factories.

Workshops are divided into two general classes: (a) Cigar shops and (b) shops in which clothing, etc., are manufactured. They are also divided into those with no employees and not requiring a license, and those with one or more employees, which do require a license.

Every place where work of the variety mentioned is carried out is designated as a workshop, but when only the owner is engaged in the work and no one is employed for wage, a license is not required. One-third of the total number of licensed shops have only 1 employee, and those employing less than 10 persons constitute more than three-fourths.

The following table presents this data:

Workshops, licensed and unlicensed, 1914.

Cigar shops unlicensed. (No employees.)	227	Other shops unlicensed (No employees.)	4,008
Cigar shops licensed.	310	Other shops licensed.	4,297
As follows:		As follows:	
Number of employees in shop.	Number of shops.	Number of employees in shop.	Number of shops.
1.....	83	1.....	1,418
2.....	47	2.....	725
3.....	39	3.....	354
4.....	36	4.....	272
5.....	20	5.....	149
6.....	11	6.....	128
7.....	10	7.....	94
8.....	8	8.....	85
9.....	9	9.....	57
10.....	4	10.....	77
11.....	5	11.....	52
12.....	3	12.....	49
13.....	4	13.....	36
14.....	5	14.....	39
15.....	2	15.....	48
16.....	4	16.....	33
17.....	2	17.....	27
18.....	2	18.....	22
19.....	1	19.....	29
20-50.....	11	20-50.....	351
50-100.....	7	50-100.....	122
100-500.....	2	100-500.....	53
500-1,000.....	1	500-1,000.....	13
Over 1,000.....	—	Over 1,000.....	4
	310		4,297
Total cigar shops.....	537	Total other shops.....	8,305
			537
Total shops per canvass.....			8,842

Workshops secure an annual license the 1st of May, and prior to this date a thorough canvass is made of all shops to determine if change of location has been effected, if the establishment is employing a larger number of persons, and if structural changes in the building or rooms, effecting natural lighting, ventilation, and the proper required air space per person, have been made. The cleanliness and general sanitary condition of the premises are investigated and the shop scored precedent to issuing a license. Eight inspectors, under the direction of a supervisor, are employed in making this canvass. The character of the walls, especially window space, floors, and ceilings, are considered in scoring the premises;

and the cubic capacity of the room or rooms is determined, and the number of persons allowed to be employed in the shop is stated for each room. Particular attention is paid to natural lighting and proper ventilation, and if a shop is found deficient in these particulars and has insufficient air space to conform to the ordinance requirements, license is withheld until the necessary changes have been effected. Toilet facilities for the different sexes are required, and this provision is rigidly enforced.

In addition to the general canvass, two inspectors are engaged in reinspection work throughout the year. They follow up shops which have been required to improve conditions.

Tables presented below show the average scores of two classes of shops:

Scores of 500 workshops.

EMPLOYING 20 OR LESS PERSONS.

Scores.	50	55	60	65	70	75	80	85	90	95	100	Total.	Average.
Floors.....	3	.....	25	.....	42	100	156	106	63	5	.....	500	79.46
Walls.....	1	.....	19	1	33	69	135	129	97	13	3	500	81.544
Ceilings.....	1	.....	19	1	33	71	129	132	98	13	3	500	81.584

EMPLOYING 21 OR MORE PERSONS.

Floors.....	2	.....	13	.....	65	78	159	82	89	11	1	500	79.804
Walls.....	5	1	19	.....	54	61	171	89	93	15	1	500	80.846
Ceilings.....	5	.....	19	.....	53	63	164	91	98	15	1	500	81.016

The general sanitary condition of workshops in Chicago is very good, in fact better than one would expect, and the standard maintained could be followed advantageously by many of the larger cities. "Sweat shops," in the common acceptance of the term, do not exist there. Adequate lighting and ventilation exist in nearly all the shops, and several of the large establishments have supplemented the natural ventilation by the installation of a mechanical system.

Many of the owners have learned that the efficiency of the employees is dependent largely upon the conditions under which they work, and in the arrangement of the machines in their rooms have taken into consideration adequate natural lighting by ample window space and the necessity for a sufficient supply of fresh air. Some of the largest shops maintain in the building a dispensary in charge of a trained nurse, equipped with cots, medicines and surgical dressings. Many dressings for minor injuries are made and medicines for simple ailments administered, so that employees, after a dressing or a short rest, can resume their work, earn their wage for the day, and save the fee of a physician's consultation.

One establishment visited has provided a large dining room for the use of employees in eating their lunch, and maintains a kitchen where soup, meat, and various other articles of food can be purchased at cost price, a few cents buying a fair lunch.

Although the ordinance prohibits the existence of workshops in basements and cellars, some small ones, with one or a few employees, exist; but the majority have been closed and none are licensed except a few in which mechanical ventilation has been installed. The majority of these cellar shops are in bad condition, with no natural light and poor and inadequate ventilation. An effort is being made by the department to close these insanitary shops, but the process is slow and tedious on account of legal difficulties that often arise.

The State board of health has 30 factory inspectors who operate under the provisions of the State factory law. A number of these inspectors are on duty in Chicago and maintain an inspection service of factories of all classes. They pay especial attention to safety devices and require their installation. Attention is also paid to ventilation, lighting, and the employment of measures for the prevention of occupational diseases. As the work of these inspectors covers a large variety of establishments not embraced by city ordinance, there is little overlapping of work by these State inspectors and those of the city health department.

Stables.—The inspection of stables as to their construction, cleanliness, and the care of manure is placed under this division, for the purpose of administration.

An ordinance enacted November 24, 1913, specifically places the care and disposal of manure under the jurisdiction of the health department, and provides that all vaults, boxes, or other receptacles for manure shall be constructed of impervious material or built with metal to answer this requirement, and shall be flyproof and fitted with flyproof covers or doors. The boxes must be of sufficient capacity to hold all the manure produced in the stable in 72 hours, and the contents of the receptacles must be removed every 72 hours by licensed scavengers at the expense of the stable owner.

The ordinance further provides that all stables of more than two stalls shall have impervious floors, and be drained to the sewer when so located as to make this possible.

In considering the general condition of stables it must be borne in mind that only a year has elapsed since specific authority over them was granted to the health department. In a city the size of Chicago considerable time is necessary for making a canvass and actually locating these establishments, and a marked improvement in their general condition and changes in the manure boxes should not be expected in a short time.

Several inspectors have been engaged during the past year in making an inspection of stables, ascertaining their general sanitary conditions, and noting especially the type and condition of the manure boxes, with a view of enforcing the provisions of the ordinance governing such receptacles. Notices have been issued in many cases and several suits have been instituted. None of these cases have yet come to trial, and the campaign for requiring the installation of proper receptacles has not been pushed with vigor because it was deemed advisable to proceed slowly until a satisfactory verdict had been reached in some of the suits filed.

A study has been made of the reports on 500 stables and these pertinent data are presented in the following tables:

Conditions found in 500 stables.

VENTILATION, REPAIR, AND CLEANLINESS.

	Ventila- tion.	Condition of stable.	Condition of floors.	Floor drainage.	Floor cleanliness.
Good.....	257	250	219	58	74.62
Fair.....	233	235	242	151	.....
Bad.....	10	15	39	7	.....
None.....	.....	.....	.....	284	.....
Total.....	500	500	500	500	74.62

FLOORS AND SCREENS.

Construction of floors:	
Wood.....	415
Cement.....	34
Wood and cement.....	36
Wood and earth.....	6
Earth.....	5
Wood and brick.....	2
Stone.....	1
Cement and brick.....	1
Total.....	500
Screens:	
In use.....	25
None.....	475
Total.....	500

STALLS.

	Number of stalls.												
	1	2	3 to 5	6 to 10	11 to 15	16 to 20	21 to 30	31 to 40	41 to 50	51 to 100	101 to 150	151 to 200	201 to 225
Stables.....	117	127	160	43	14	4	7	6	2	10	3	0	1

MANURE RECEPTACLES.

Location:		Condition:	
Barn.....	51	Good.....	108
Alley.....	191	Fair.....	76
Yard.....	48	Bad.....	160
Lot.....	54	Total.....	344
Total.....	344	Covers:	
Kind:		With.....	249
Boxes.....	216	Without.....	5
Vaults.....	116	Total.....	344
Chutes.....	5	Drainage:	
Wagons.....	5	Drains.....	6
Barrels.....	2	None.....	338
Total.....	344	Total.....	344
Construction:		Receptacles, none.....	156
Wood.....	279	Total stables.....	500
Cement.....	34		
Wood and brick.....	10		
Brick.....	7		
Cement and brick.....	5		
Stone.....	5		
Iron.....	3		
Earth.....	1		
Total.....	344		

A study of the tabulated data shows that the score of floor cleanliness of 74.62 per cent is too high from a sanitary standpoint, as more than 50 per cent of the stables are without drainage and the bulk of the floors are of wood and not impervious material. Furthermore the condition of the manure boxes is very unsatisfactory. The inspectors of the efficiency division examined 142 stables, and in no instance was the manure receptacle found to be fly-proof.

On the whole the stables are in poor condition from a sanitary standpoint, drainage is absent or inadequate, floors are not of impervious material, and manure boxes are in bad condition and not fly-proof.

Miscellaneous Division.

There are grouped under this division the following: Rendering plants, soap factories, tanneries, glue factories, and the licensing and control of private scavengers.

Rendering plants.—There are 41 rendering plants, some of which are quite extensive and utilize all the by-products of slaughtering for the manufacture of different articles; in fact, it may be said that a large establishment like that of Armour & Co., and a few others of similar magnitude are able to utilize every part of a slaughtered animal.

Ordinances provide as follows:

License must be secured and the application to the commissioner of health must show location of said business and plans and specifications of the buildings to be maintained, the details of construction, devices, and appliances to be employed and the proposed manner of operation.

Offensive odors arising from rendering plants must be destroyed by combustion, condensation, or other means equally effective, and must not be allowed to escape into the outside air. The type of condenser and methods of operation are prescribed.

No person is permitted to conduct any process of rendering in a manner to generate offensive gases, deleterious gas, deposits, or exhalations that are dangerous or detrimental to life or health, and the production of such gases constitutes a nuisance.

The large plants operate, in connection with their rendering establishments, soap factories, glue factories, the manufacture of fertilizers, cleaning powders, and, in one visited, the manufacture of glycerin. One also made a specialty of chicken feed, composed of the dried meat residue, after grease extraction, and bone meal.

The smaller rendering plants are chiefly engaged in producing grease for soap making, one handling especially the garbage from restaurants and hotels for this purpose.

An inspection was made of nine rendering plants, two soap, two fertilizer, one glue factory, and three tanneries. Conditions were found unsatisfactory in two small rendering plants; another was dirty, and a third could have been kept cleaner.

One inspector is detailed for supervision of the rendering plants, and these plants in the main are kept in a satisfactory condition. Two other inspectors in this division inspect tanneries and manure-loading stations, and exercise supervision over 200 private scavengers and collectors of butchers' offal. There are 15 soap factories and 20 tanneries.

Private scavengers.—Ordinance provides that any person or corporation acting as a private scavenger shall be licensed and shall pay the sum of \$5 for each and every wagon used in the service, and that a bond shall be given to insure proper performance of the work.

Private scavengers are those engaged in the removal of garbage from hotels, restaurants, boarding houses, apartment houses, cafés, and other places not otherwise provided for by the city; and the removal and disposal of manure, swill, or any animal or vegetable refuse.

The manure is taken in covered carts to one of 17 loading stations, where it is loaded on cars and shipped to the country for sale to the farmers. Two contractors handle the manure at the station, arrange for the cars, and effect the sale. These loading stations are kept in a satisfactory condition.

As already stated, the garbage from hotels, restaurants, etc., is taken to one of the rendering plants for grease extraction. As such garbage is rich in particles of meat, the yield more than pays for cost of collection.

Ashes are also removed by private scavengers from hotels, etc., and are either taken to one of the dumps or used as filling material along the water front.

Privy vaults.—As the cleaning of privy vaults must be done by licensed night-soil scavengers, this is probably the best place to consider them.

The ordinance provides that the sides shall be water-tight and it governs the location and the manner of cleaning.

Any person or corporation that removes the contents of privy vaults is deemed a night-soil scavenger and must be licensed and execute a bond in favor of the city.

A permit for cleaning must be secured. The permit fixes the price at not exceeding 10 cents for each cubic foot of night soil removed.

The ordinance governing the construction of privy vaults is not effective and privies are generally poorly built with wooden sides. Where sewer connections are available all houses must install plumbing fixtures and connect with the street sewer. All existing privy vaults in such localities must be filled and abated.

There are approximately 4,000 privy vaults in the outlying sections of the city. When a canvass was made a few years ago there were 8,000, but this number has been reduced about 50 per cent by the extension of the sewer system, and on account of the fact that

persons are now more disposed to build only in the improved districts. The installation or construction of septic tanks for the use of houses in unsewered districts does not seem to have claimed attention.

Division of Complaints.

This division has probably the most complicated functions of any in the bureau, as it deals with the complaints of citizens and the abatement of nuisances. The work is of a nature to require application of the ordinances and the judgment and sound sense of the inspectors.

The city, for administration purposes, is divided into a central section containing eight districts, and an outlying section embracing six districts. Each section is under a supervisor, and an inspector is assigned to each district; therefore, there are 16 employees engaged in the work of this division.

Ordinance provisions.—Ordinance provides as follows:

It is the duty of the commissioner of health to serve a notice in writing upon the owner, occupant, agent, or person in possession, charge, or control of any building or lot in or upon which any nuisance may be found, to abate the same in such manner as he shall prescribe, within a reasonable time.

Matters and things dangerous or detrimental to health constitute a nuisance, and are not allowed to exist in connection with any business.

Factories, stables, tanneries, rendering plants, and other establishments of this kind which become foul and offensive are a nuisance.

Whenever any nuisance is found on any premises, the commissioner of health is authorized in his discretion to cause the same to be abated in such manner as he may direct.

Administration.—Complaints are received by letter or postal card, telephone or verbally, and anonymous complaints are now accepted in writing, whereas formerly it was held that if the condition complained of was not of sufficient gravity to warrant the name of the complainant it was too trivial to investigate. The information given is often meager and not sufficiently exact to facilitate the work of the inspector, and he has often to search different premises in the neighborhood before locating the conditions concerning which complaint has been made.

Two junior clerks are now engaged in receiving complaints, and as the records show that about 46 per cent of the complaints received show no cause when investigated, it is evident that a more experienced clerk, one familiar with the ordinances concerning nuisances, should be assigned to this duty, and more attention paid to securing exact data as to the location and nature of the nuisance, especially from persons calling at the office or using the telephone.

The method used in handling complaints is as follows: The receiving clerk writes the pertinent data on a card, giving the location of the premises and the conditions about which complaint has been made.

The name of the person making the complaint is written on the back of this card, except in anonymous cases. These cards are arranged in piles according to districts and turned over to a stenographer who transcribes this data on duplicate assignment slips. There are generally several complaints enumerated on a slip. The original is given to the inspector and the duplicate retained as an office copy. The inspector investigates and reports conditions found, and indicates the proper remedial measures to be carried out and the time necessary for abating the nuisance. These data are entered on a file card and a written notice is sent to the responsible party to remedy the insanitary conditions in a specified time. Upon the expiration of the time granted, a reinspection is made and if nothing has been done, a commissioner's letter is written; then if another reinspection shows that the nuisance has not been abated, the case is turned over to the suit clerk and the responsible party is prosecuted.

Often complaints are made that clearly fall in the province of another bureau, and in such cases the complaint is referred to the bureau having jurisdiction.

A study was made of 1,500 complaint cards and the following pertinent data may be of interest in this connection:

Complaints without cause.....	724
Anonymous complaints.....per cent..	13
Anonymous complaints without cause.....do....	46

This study showed that the average time between the date of assignment to the inspector and that of issuance of notices was 6.5 days, and between the date of notice and that of abatement, 62.25 days. This is a very satisfactory showing concerning the time for investigation, and that for abatement is a marked improvement over the results secured in preceding years.

In some instances the subject matter of these complaints is trivial, but in many cases there is some real basis of annoyance or offense.

In the pronounced cases, serious nuisances exist that may involve large areas, thereby taxing the ingenuity of the inspectors in indicating the proper remedial measures for abatement. In the investigation of complaints much depends upon the judgment of the inspector and the interest he has in his work for the proper determination of the cause and the suggesting of a sufficient remedy.

During 1914 this division handled 22,582 complaints and issued 15,774 notices. More than 40,000 reinspections were made.

The steady increase in the number of complaints is shown by years as follows:

1910.....	15,100
1911.....	16,200
1912.....	19,605
1913.....	17,071
1914.....	22,582

House-to-house inspection.—This important sanitary work is not receiving the necessary attention on account of lack of a sufficient number of inspectors to execute this work and that of the various activities of the bureau of sanitation. It is estimated that there are 1,200 blocks in the city of Chicago where such an inspection service is desirable, but the most that can be accomplished is the inspection of an average of 120 blocks annually. Generally one, but at times two inspectors, are engaged in the work, who are supplemented by other inspectors when the investigation of complaints does not require all their time.

There is no inspection of tenement houses other than mentioned above. In fact, no ordinance exists authorizing such an inspection service.

Division of Suits.

By far the greater number of suits instituted by the health department originate in the bureau of sanitation on account of its diversity of functions and its having charge of complaints and the abatement of nuisances.

When there is violation of an ordinance and the responsible party, upon notification by the health department and after a commissioner's letter has been sent, fails to correct the conditions resulting from the violation, suit is instituted by the following procedure: After reinspection shows that the violations have not been corrected the reviewing inspector turns the slip over to the inspector in charge of suits, who prepares, on a card, which is transmitted to the commissioner's office, all the data embraced by the violation, the resulting conditions to be remedied; and the numbers of sections of the ordinance violated.

On the day or two preceding the date set for trial of the case, the suit inspector visits the premises on which the report has been made so that he will be able to testify at the trial concerning present conditions.

All the suits originating in the bureau are handled by one inspector designated for the purpose of preparing the case, examining the premises, and testifying in court; hence none of the other inspectors are obliged to lose time by appearing as witnesses in cases.

The records of the bureau show that 2,848 suits were instituted during 1914, of which number 1,897 were disposed of as follows: Convictions were secured in 749 cases, and 982 were withdrawn, dismissed, or otherwise terminated with the consent of the department because the orders were complied with before the case finally came to trial, leaving 166 nonsuited, withdrawn, canceled, etc. The remaining number had not reached final disposition; they embraced suits filed in the last months of the year, not yet reached on the court calendar.

Clerical Division.

The general work of the office is under the direction of a chief clerk who is very competent in routing the different work and in keeping the office records up to date. The volume of work in the office is large. In 1914 the office handled 21,991 complaints, issued 36,174 notices, and wrote 15,154 prosecuting attorney's letters.

The work of the office is best considered under the following heads:

Time keeping.—Three methods of keeping time are followed:

- (a) Roll call at 9 a. m. of all employees, field and office.
- (b) All field employees are required to make daily reports of the manner in which they utilized their time during working hours.
- (c) Office employees indicate their time on regular civil service form prescribed for this purpose.

It would seem that the roll call could be dispensed with, since the time of the employees is recorded on their daily time reports.

The inspectors' daily report cards provide spaces for indicating time spent in office, in the field, at lunch, and work done at home; also for indicating class of inspection done and variety of test made; and contain spaces for entering in detail each address at which an inspection or test was made. These cards are in the main satisfactory.

Efficiency records.—The bureau endeavors accurately to record the efficiency of employees, and has worked out minimum work schedules for the different classes of inspection. However, the absolute marks obtained in this manner are often modified by a judgment mark, and the efficiency of office employees is marked solely on a judgment basis. Some classes of inspection work require more time than others, and this fact should be taken into consideration in efficiency markings; recognizing this, the bureau appointed a committee on efficiency to work out a proper standard for estimating the units of work that should be required in a day. The relative values of different inspections, based on the time required for properly marking, were computed and graded, and 30 work units a day were considered the minimum standard. As each class of work was given its proper rating, an inspector could attain the day's requirements by any total combination of the units for the different inspections. A scheme of this kind furnishes a more reliable index of the amount and character of work done by the inspector and to a large extent eliminates judgment markings.

Files.—The activities of this bureau are so varied that an extensive filing system is required and 20 distinct files are kept. This seems to be a large number, but as each activity requires a file for its records and several cross index files are necessary, it becomes apparent that the work of the bureau is best served by this complete system. The

files are in good order and up-to-date, but the charging system for records removed from the files is not carefully administered and could be improved.

Statistics.—Statistics are compiled by the longhand method, and it would seem advisable to employ mechanical tabulation for this work. The statistics cover every activity of the bureau and are therefore voluminous.

Administration.

The study of this bureau shows that the general administration is faulty in some respects.

1. The bureau chief requires practically all matters to be referred to him and does not place a proper division of the work on the assistant chief and the supervisors. The bureau chief is of unquestioned ability and a tireless worker, but much of the minor details that consume his time could as well be left to his assistants, thereby enabling him to exercise a closer check over his supervisors, and have more time to devote to the extension of the activities of his bureau in important matters affecting the public health.

2. The assistant bureau chief should be given more authority and the control of more than one division, so that all questions for which a precedent exists or which do not involve intricate problems could be decided by him, thereby relieving the chief of much unnecessary time-consuming labor.

3. The supervisors at present spend most of their time in the office, as follows: (a) Office routine; (b) consultation with inspectors; (c) consultation with the public; and (d) consultations with the bureau chief (for the latter purpose often wasting considerable time waiting for an opportunity). The duties of the supervisors are indicated by their titles, but in order to determine that the inspectors are properly carrying out their work this supervision must extend to field activities; the more time spent in checking up the work of the inspectors the better, and certainly at least 50 per cent of their time should be spent in the field. The supervisors should be given authority to decide all routine questions upon which the inspectors desire information and decision, consulting the chief of their division, assistant bureau chief, or chief of bureau only on questions for which no precedent exists or those involving questions of policy.

4. Under present schedule the inspectors report at the bureau at 9 a. m. and are given one hour to prepare a report of the preceding day's work, receive assignments, and consult on matters that require instructions. They are expected to start to their respective districts at 10 a. m. A study of the daily time reports of the inspectors shows that instead of spending only 6 hours a week in the office, the average time for all inspectors so spent is $12\frac{1}{2}$ hours, with a minimum of 4 hours

and a maximum of 40½ hours. There is no question that too much time is spent in the office, and very often the inspector does little work before his hour for lunch is taken. One hour is sufficient for preparing ordinary reports and the supervisors should be held responsible for their inspectors, should be required to see that time is not wasted by dilatory practices, and that the inspectors start promptly for their districts, and should follow their inspectors up in order to see that the proper amount of work is being performed.

The new organization for 1915, which provides a supervisor of housing and sanitation, will increase the efficiency of the bureau and will be advantageous in every respect. It provides for three divisions instead of nine and divides responsibility among three heads as assistants to the bureau chief, and relieves the latter of much detail and routine work, thereby enabling him to devote more time to questions of policy and insuring better supervision of the work of the bureau as a whole.

In concluding this report on the study of the work of the bureau of sanitation, attention is directed to the following statistical data, which show a steady increase in the activities of this bureau. It is also believed that the quality of the investigations made has progressively improved.

Comparative statements by years.

	1908	1909	1910	1911	1912	1913	1914
Plumbing inspections.....	28,886	26,359	30,386	35,808	37,300	39,493	43,749
All other inspections.....	36,293	42,532	42,258	43,175	43,285	45,356	63,485
Reinspections.....	40,868	66,174	76,233	81,855	67,502	93,351	108,507
Grand total.....	106,052	135,365	148,877	160,838	148,087	178,200	215,291

The relatively small number in 1912 was occasioned by lack of appropriation and the consequent laying off of the inspectors near the end of the year.

The following table contains data pertinent as showing the increase in work out of proportion to the increase in the number of employees and the money expended:

Report of sanitary bureau for years 1909 to 1914 compared with year 1908 in regard to cost per inspection, increase of work, etc.

	1908	1909	1910	1911	1912	1913	1914
Number of employees....	88	89	87	90	105	102	116
Total appropriation, salaries.....	\$111,998.00	\$106,559.73	\$102,152.00	\$110,978.00	\$129,445.00	\$137,664.00	\$158,564.00
Actual expenditures, salaries.....	\$100,081.14	\$100,810.80	\$102,005.28	\$110,758.61	\$118,511.72	\$137,584.65	\$151,010.28
Per cent increase of salaries.....		0.007	2	10	18	37	51
Total inspections and re-inspections.....	106,052	135,065	148,877	160,838	148,087	178,200	215,291
Per cent increase of work.....		27	40	51	40	68	103
Per cent increase of force.....		1	-1	2	19	16	31
Cost per inspection.....	\$0.94	\$0.74	\$0.68	\$0.68	\$0.80	\$0.77	\$0.70

[This report will be concluded in a subsequent issue.]